

MMS ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

Region: Alaska

Planning Area: Beaufort Sea

Title: Mapping Sea Ice Overflow Using Remote Sensing from Smith Bay to Camden Bay (AK-06-06)

MMS Information Need(s) to be Addressed: This information is important to identify and characterize potential hazards, such as from strudel scour along the Beaufort Sea coast. In addition this information could be used to assist in the development of ice models and their performance during breakup in the landfast ice zone. The results will be used in NEPA analysis and documentation for Beaufort Sea Lease Sales, EPs, and DPPs.

Total Cost: \$475,000

Period of Performance: FY 2006-2009

Conducting Organization: D.F. Dickins Assoc. Ltd.

MMS Contact: [Chief, Alaska Environmental Studies Section](#)

Description:

Background MMS has limited spatial and temporal information on rivers overflowing the nearshore sea ice in spring. The most recent work in 1999 focuses on overflow of the Sagavanirktok River in the vicinity of the proposed Liberty prospect. There are also 3 years of overflow data for the Kuparuk River in the vicinity of Northstar. Landsat imagery from projects in 1988 and 1993 has been collected and archived at the University of Alaska Geophysical Institute for the Beaufort Sea. With the advent of development in the Beaufort Sea this type of information is needed to address issues regarding pipeline routing and facility siting. Analysis of overflow and its implications for exploration and development requires information on both the temporal and spatial distribution of ice overflow from the breakup of North Slope rivers in the spring. This study would provide baseline data and improve the accuracy of information for environmental assessment and hazard mitigation. These observations would also be of value to the offshore industry for planning operations on the OCS.

Objectives

1. Compare the helicopter survey of the zone of overflowing for the Colville river delta against satellite imagery collected for the same time period.
2. Utilizing satellite imagery, map the overflowed areas for the major North Slope river systems from 1997-2007
3. Compare overflow areas of the landfast ice to strudel scour locations

Methods

1. Collect and synthesize existing Landsat/Radarsat/MODIS and other available remote sensing imagery.

2. Quantify the spatial and temporal distribution of river overflow of the moderate size rivers on the North Slope of Alaska from Smith Bay to Camden Bay. Focus on mapping the maximum overflow extent.
3. Compile Beaufort Sea stream gauge data.
4. Fly an aerial survey along the Colville River delta for one season to ground truth remote sensing data and quantify uncertainties of estimating the overflow from remotely sensed data.
5. Collect hydrographic data for the Sagavanirktok and Kuparuk rivers and quantify any relationship between river runoff and aerial extent of overflow.
6. Compile available spatial data on the location of strudel scours from existing surveys along the Beaufort Sea coast
7. Compile all of the overflow limits and available strudel scour data into a Geographic Information System (GIS) database
8. Provide a report that summarizes the spatial distribution of river overflow by year along the Beaufort Sea Coast. Provide individual years as well as minimum and maximum historical overflow extents from 1996-2007.
9. Compare overflow extent to the location of strudel scours and other environmental variables

Current Status:

The 2007 field season mapping the overflow area of the landfast ice of the Colville river delta is complete. The 2007 overflow areas for all major river systems along the North Slope of Alaska was mapped and documented. The Contractor provided a spatial database of the overflow areas and a technical summary of the preliminary data results for 2007. The Contractor is completing the interpretation of the historical overflow areas from satellite imagery. The Contractor is also actively acquiring environmental data, and is beginning to build a database to store the information.

Final Report Due: March 2009

Publications Completed: None

Affiliated WWW Sites: <http://www.mms.gov/alaska/>

Revised Date: March 2008